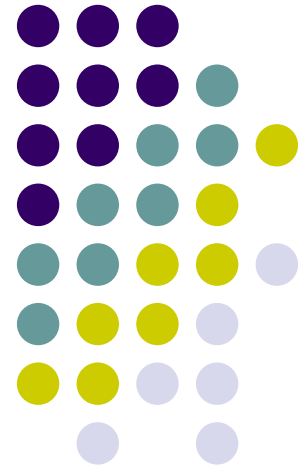


Cisco Best Practices Brief

6/20/06





Purpose of this briefing

- To answer the following questions about the operation and management of Cisco Routers:
 1. What are some "Cisco Design Strategies" regarding the operation of a Cisco network like IHS?
 2. What types of operational processes do similar size agencies, and commercial businesses use to simplify management and increase operational uptime in a Cisco network?
 3. What direction is Cisco Directing its customers and why?
 4. What information should a customer use to effectively work with Cisco?

Qualification of Analex/ComGlobal Cisco Team



- Analex is a 1500 person government contractor that specializes in Intelligence, Defense and Space Launch.
- ComGlobal IT is a commercial business consulting firm that focuses on business consulting in large Cisco Networks in State/Local Government and large businesses.
- Our average commercial customer has between 200 and 4000 Cisco devices with between 30 and 600 branch locations.
- We have been working with Cisco as a customer and consultant since 1995.





Cisco Design Strategies and Operation Processes to Simplify Management and Improve Uptime in Cisco Routed Networks:

Cisco Design Strategies



- **Equipment Standardization:** Getting Hardware and Software on Cisco devices to the same standards is critical to effective maintenance.
 - Case Study: A casino chain we worked with standardized on 4 Cisco devices across their 17 casinos. A large core switch, a closet switch, an edge router and a wireless access point. They installed over 4000 of these devices. They estimate their support cost went down by 25% vs the 25+ different devices they had in production before.

Cisco Design Strategies



- **Smartnet Maintenance:** Cisco sells smartnet for all their router devices. The main advantage of this “Extended Warranty” type of support is that it allows for “cross-shipping” of Cisco parts.
 - *Cross-shipping: Cisco will ship you almost any part related to the warranted device that you need, from memory, line cards, to even the entire chassis. They ship it next day or same day, then they give you a return box to ship back the old part. If you do not return the old part, they charge you for the part they shipped you.*
- **Strategy for Smartnet:** Get Smartnet on any device that you don’t have a spare device for. On the other hand, if you have a lot of the same devices, it is often easier to have one or more spares, then to buy a large number of Smartnet contracts.

Cisco Design Strategies



- **Configuration Tracking:** Who did what, when, and to which device are often questions asked after the fact when there are outages related to configuration mistakes.

According to a study done by Rendition Networks, over 40% of router related downtimes involve configuration errors.

- **Strategy to Track Configurations:** The NOSC has a Tacacs server that logs all the commands typed into a router by username. If any new devices come up, we need to know about them for tracking purposes.

Cisco Design Strategies



- **Cisco Device Configuration Standardization:** In order to make managing 500 or so devices, certain standardizations should be considered:
 - **IP Address Numbering:** Devices should follow somewhat of a similar nature. IE: Routers should be the first number in the IP range. Servers the next 20 etc. This helps administrators easily figure out what is what.
 - **Naming Schemes:** Devices should have a standard scheme that follows their function. Random names for devices hinder the process.
 - **Time (NTP):** Devices should all be integrated with a Network Time server, so their logs are all on the correct time. Having device logs that are not time synchronized will increase management costs.
 - **Access List Numbering and other Cisco Configuration Standards:** The configuration in a router should be the same as the others in a network. If an access-list is used, it should use the same name as similar access-lists on other devices.



Cisco Design Strategies

- **Routing Protocols:** Most Cisco Network incorporate dynamic routing protocols.
- *Because the VBNS network supports only BGP as a routing protocol, for IHS areas, the strategy would involve upgrading routers to the level that they can run BGP.*
- *This would allow for redundant routes, quality of service, and alternative path routing.*

Cisco Design Strategies



- **Cisco Technical Assistance Center (TAC):** TAC is the Cisco Support system for Smartnet warranty, as well as regular warranty. Here are some of the Design Strategies for working with TAC:
 - For best response: Open all your TAC support tickets through the Cisco Website except “Network Down” events.
 - Network Down requests need to be made via calling the TAC on their 1-800 number.
 - Make sure all your Smartnet Contracts are associated with your Smartnet Login.
 - When you open a TAC case, make sure you are ready to work on the case AS SOON as they call you back.
 - If you are not ready to work on the case, most likely the Cisco engineer will be very difficult to reach when you call him back when you are ready.



Cisco Design Strategies

- **Central Organization of Circuit Information:** In order to improve the speed in which a circuit is repaired the following information must be easily available to give to the telco when requesting telco support for a network circuit.
 - **Circuit IDs for the Circuit:** This involves usually a Verizon circuit ID, and a Local ILEC Circuit ID. If these ID's are not available, this can cause delay before the downed circuit can be identified.
 - **Local Site Contact:** When calling in a circuit, the telco will always ask for someone locally onsite, in case they have to access the facility. Having a local contact available will speed up the facility.
 - **Pictures and descriptions of the Demarc:** A lot of times it helps to have a picture of the telco demarcation point (demarc). Often the picture can be sent to the tech from the telco to point out their endpoint equipment.

Cisco Design Strategies



- **Local Onsite Responsibilities:** During many cutovers, software upgrades, and maintenance often a local person will have to be involved to assist. Here are some of the things that local contact needs to be familiar with in order to help support a branch office of a Cisco routed network:
 - Laptop to connect to a router.
 - Cisco console cable to connect from laptop to the router.
 - A terminal client, like HyperTerminal, or SecureCRT.
 - Knowledge of where the router is physically located, keys to unlock that closet etc.
 - Cell phone or office phone that reaches into that closet or datacenter room.
 - Knowledge on who to inform, to make sure the users know about an upcoming outage.
 - Knowledge on how to test to see if the network is working after a change.
 - Camera or camera-phone to take pictures if necessary of the demarc.
- *Often a good local contact can make the difference between a quick repair, and a long downtime.*



**What Direction is Cisco Leading
its Enterprise Customers?**

**What information should a
customer use to effectively work
with Cisco?**

What Direction is Cisco Leading its Enterprise Customers?



- Cisco has approximately 40,000 Sales Account Rep all over the world.
 - They are primarily commissioned based.
 - The average “sales quota” per rep, is around \$7M/year.
- Thus...
 - Big deals are better than small deals for Cisco reps. It's often as hard to close a small purchase of 1 device as it is to sell 500 devices.
 - Cisco reps fight with other Cisco Reps for the same sales.
 - The #1 products in dollars for Cisco is network switches and routers. Many products they sell are involved with forcing their customers to upgrade their switches and routers.

What Direction is Cisco Leading its Enterprise Customers?



- Why does Cisco want you to upgrade your switches and Routers?
 - *Two main reasons:*
 1. Many vendors sell switches and routers at a significantly lower cost than the equivalent Cisco switch. This is good for the initial capital outlay, but over time non-cisco low cost switches and routers from almost any brand have the tendency to cause network issues in an enterprise. These products work well in a small environment, but often fail in an enterprise.
 2. Cisco makes the majority of its revenue from switches and routers. The reason is, these products are well built widely tested by their millions of customers and require little support from Cisco, except for minor hardware issues.

What Direction is Cisco Leading its Enterprise Customers?



- *Examples of Cisco Products that force a customer to upgrade their Switches and Routers:*
 - **Cisco Voice over IP:**
 - In order to power your phones through the ethernet, you will need to upgrade your closet switches to Cisco switches.
 - Cisco will recommend for quality of service to work, you need cisco edge and core switches.
 - In order to connect to the phone company, Cisco will recommend you upgrade your branch office router to a router that supports VoIP gateway cards.
 - **Cisco Video over IP:**
 - Same as VoIP
 - Multicast
 - **Cisco Security Products:**
 - Cisco Intrusion Detection cards require upgraded routers.
 - VPN Accelerator cards
 - **Any Higher Level of Cisco IOS Code:**
 - BGP Routing Protocol requires a chassis upgrade for most IHS sites.
 - Security code requires a faster processor than most IHS sites run.
 - And etc...

What information should a customer use to effectively work with Cisco?



1. **Push Quantity:** You get the best deals and service from Cisco depending on the size of a deal. Anything over \$100k is better than a bunch of small deals.
2. **Cisco Part-list is Available:** The Cisco part list is a 65k+ line excel sheet. All the list prices are included, and the standard GSA discount is in the 30% off list range. This allows for easy WAG budgeting for Cisco parts.
3. **New Features will most likely require Core upgrades:** If you are looking at VoIP or other new Cisco products, be ready to hear that Cisco will want you to replace any non-cisco switches/routers to make this solution work.
4. **Cisco Reps are Commission Based:** Just remember, don't ask Cisco how many routers/switches you NEED to buy. They will often sell you more than you need.

Thanks for your Time

